Figure 16 is a cross-sectional view of the embodiment depicted in Figure 15, taken along line 16-16.

Figure 17 is a perspective view of another embodiment of the specimen-handling tool of the present invention.

Figure 1 discloses an embodiment of a diagnostic system 20 according to the present invention that may be utilized for many types of diagnostic testing. Such diagnostic tests utilize a biological test specimen such as, for example, tissue biopsy, blood or saliva. The diagnostic system 20 may include a carrier 22 and a mechanism by which a user may manipulate a sample of tissue, such as, for example, the specimen-handling tool 24 that is shown in Figures 1, 6 and 10. As depicted in Figure 15, the diagnostic system 20 may further include an overlying member 23.

As shown in Figures 1-3, 5, and 12, the carrier 22 may include a first well 26 and a second well 28. The wells 26 and 28 may be defined, at least in part, by the walls 27 and 29, respectively. The wells 26 and 28 may be formed to have a variety of different depths and cross-sectional shapes, some variations of which are shown in Figures 5, 12-14 and 16. The wells 26 and 28 of the carrier 22 may be variously formed, and may have similar configurations or dissimilar configurations. As shown in Figures 1, 2, and 5, the wells 26 and/or 28 are generally frustoconical in shape, although the wells 26 and/or 28 may be cylindrical or otherwise shaped. The wells 26 and/or 28 may be formed so that, when viewed from the top of the carrier 22, the wells 26 and/or 28 have a non-circular shape, such as an elliptical, square, rectangular, D-shaped or any other shape.

One or more projecting members, such as the projecting member 34 that is shown in Figures 12-14, may be disposed within one or both of the wells 26 and 28. At least a portion of the projecting member 34 may be disposed outside of the interior of the wells 26 and/or 28. The projecting member 34 may be integrally formed with the walls 27 and 29, or may be attached to the walls 27 and/or 29. Such projecting members 34 may be configured to assist removal of the specimen such as, for example, a biopsy specimen, from the specimen-handling tool 24.

These projecting members 34 may be configured to assist the user in accurately positioning a specimen within the well 26 or 28.

The wells 26 and 28 may also include a step such as the step 32 that is depicted in Figure 13.

The carrier 22 may have many different overall exterior shapes, such as, for example, the generally rectangular shape as shown in Figures 1, 2 and 5. The carrier 22 may be alternately shaped, such as, for example, square, oblong, triangular, and the like. The carrier 22 may, as shown in Figures 1-3, include two elongated sides 38, two ends 40 and a surface 44. The ends 40 may be configured to be easily grasped by a user and one, none or both of the ends 40 may include an arcuate portion 42 as shown in Figures 1 - 5.

As shown in Figures 1, 2, 4 and 5, the carrier 22 may include a surface 44. The first and/or second wells 26 and 28, respectively, may be configured to extend downwardly from the surface 44. As shown in Figures 1 and 2, the carrier 22 may also include a cavity 30. In a similar manner, the cavity 30 may be configured to extend downwardly from the surface 44, as shown in Figures 1, 2 and 5. As shown in Figures 12-14, one or both of the wells 26 and 28 and/or the cavity 30 may be formed so as to extend upwardly from at least a portion of the surface 44.

A mechanism by which a user may manipulate a sample of tissue, such as, for example, the specimen handling tool 24 such as that shown in Figures 1 and 6-11, may also be included in particular embodiments of the diagnostic system 20 of the present invention. The specimen-handling tool 24 may be disposed within the cavity 30.

The cavity 30 may, as shown in Figures 1-3, be configured so that it is disposed about at least a portion of one of the first and/or second wells 26 and 28, respectively. The carrier 22 may also be configured so that a specimen handling tool 24 may be otherwise retained in the carrier 22 so that it is disposed about at least a portion of one of the first and/or second wells 26 and 28, respectively. As shown in Figures 12 and 13, the carrier 22 may be configured so that the specimen-handling tool 24 is secured in a particular position by one or more ribs 84. The specimen-handling tool 24 may be removably attached to the carrier 22 by one or more locking arms, breakaway tabs, adhesive, or the like.

One or more rails 46 may be included in selected embodiments of the present invention and may be disposed on the carrier 22 so that the rails extend upwardly along at least a portion of the surface 44. One or more rails 46 may also be configured to extend outwardly from the carrier 22. At least one gap 48 may be formed in one of the rails 46 that extend along a portion of the carrier 22.

As shown in Figure 3, one or more supports 50 may be provided which extend downwardly from the surface 44. As seen in Figure 3, the supports 50 may be attached to the wall (or walls) 31 that form at least a portion of the cavity 30 and may extend outwardly from those wall 31 to permit the carrier 22 to rest in a stable position on a horizontal or other surface. The rails 46 and the supports 50 may be configured to enable the carrier 22 to be automatically processed through a variety of equipment.

If desired, the surface 44 may be configured so that various indicia, such as letters, numbers, symbols and other characters, may be placed onto or formed into the surface 44. For example, and as shown in Figure 2, each well 26 and/or 28 may be given a particular designation, such as A or B, and that designation may be printed upon the surface 44.

The carrier 22 may be formed from a variety of materials, including, for example, polycarbonate, polystyrene, polypropylene, polyethylene, polyvinylchloride, or any other type of polyolefin.

A separator may be disposed between the first and second wells 26 and 28, respectively, to permit the first well 26 to be separated from the second well 28. For example and as shown in Figure 1, the separator may be configured as a series of perforations 35 which are configured to permit the carrier 22 to be broken into two separate portions; a first portion containing the first well 26 and a second portion containing the second well 28. The separator may also include a single perforation 35, as shown in Figure 12. The gaps 48 in the rails 46 may be positioned to enhance the separability of the wells 26 and 28 from each other, as seen in the embodiment depicted in Figure 1.

As shown in Figure 2, the separator may also be formed as or include a depression 36, which may be formed in the surface 44 of the carrier 22. The depression 36 may have many different shapes, such as, for example, v-shaped or arcuate.